CORPS OF ENGINEERS MILITARY CONSTRUCTION: MANAGEMENT COSTS BELOW THE INDUSTRY AVERAGE

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Executive Summary

CORPS OF ENGINEERS MILITARY CONSTRUCTION: MANAGEMENT COSTS BELOW THE INDUSTRY AVERAGE

The United States Army Corps of Engineers (USACE) manages more than $3 billion of Federal Government construction each year. Its Federal customers include the Office of the Secretary of Defense, the Military Departments, and Federal agencies. The construction management services that USACE provides are paid for through fees assessed against the placement value of the construction.

Some customers believe that the fees charged by USACE are too high. We find this is not the case. USACE is a full-service construction management organization and the fees it charges compare favorably with what private-sector construction management firms charge for equivalent services. We find most USACE customers are not aware of all the services they receive from the Corps.

We recommend that the Director of Engineering and Construction communicate our findings to USACE customers. We believe a brochure explaining USACE services and fees should be published and distributed to them.

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INTRODUCTION AND RESULTS OF THE ANALYSIS

INTRODUCTION AND BACKGROUND

The United States Corps of Engineers (USACE) provides construction management services for more than $3 billion of construction each year. Those services, generally referred to as supervision and administration (S&A), are provided to the Military Departments, Defense agencies, and other Federal agencies. Most USACE customers pay for services through construction management fees applied to the cost of the constructed project. This fee is referred to as the S&A rate. The remaining customers pay on a cost-reimbursement basis.

Some USACE customers believe that the S&A rate is too high for the services they receive. USACE is sensitive to that concern, and periodically reviews its S&A rate structure to ensure that it is fair and reasonable. As part of the periodic review process, USACE requested our review of the construction management services USACE provides and the fee it charges for those services.

Our review identifies and defines the services that make up construction management in general, quantifies the USACE costs associated with providing those services, and compares USACE costs to those experienced in the private sector. Our review covers only USACE's Military Construction Program. It does not cover the Civil Works Program. We first developed a list of services that describes construction management as practiced by both USACE and the construction industry. The list of services (see Table 1) and their definitions were compiled from the Construction Management Association of America's (CMAA) *Manual of Standard Practice*. The definitions were used to identify the services provided to USACE customers and to compare them with services normally provided in the private sector. The definitions and the comparison of USACE and private sector services are presented in Appendix A. The division of services among USACE organizational levels is shown in Appendix B.

We used project-level cost data in the review. However, actual construction management cost records at the project level are not available through the Corps of Engineers Management Information System (COEMIS) – USACE's cost accounting

system – due to system limitations. We estimated project-level costs using the Corps of Engineers Resource and Military Manpower System (CERAMMS). Our general approach was to use CERAMMS to estimate the manpower required to manage a given level of construction, determine the cost of that manpower, and then calculate the estimated S&A rate. A detailed discussion of the estimating methodology is contained in Appendix C.

TABLE 1

CONSTRUCTION MANAGEMENT SERVICES

Predesign Services
Project Management
Scheduling
Cost Management
Contract/Project Administration
Design and Bid Phase Services
Project Management
Scheduling
Contract/Project Administration
Construction Phase Services
Project Management
Scheduling
Cost Management
Contract/Project Administration
Quality Assurance
Additional Services
Procurement of Materials
Value Engineering
Claims Analysis
Administration of Social Programs
Labor Rates
Post Construction Activities

Note: See Appendix A for definitions.

Private sector construction management costs were somewhat easier to identify; we did so from a CMAA survey (see Appendix D). In that survey, construction management firms provided project-level data on the services they provide and their costs. The data were used to develop the private sector costs for providing construction management costs.

FINDINGS

We found from the CMAA-sponsored survey that few private-sector construction management firms provide all the services required for construction management (see Appendix D for the survey results). On average, private sector firms provide their customers only 80 percent of the construction management services identified by the CMAA, whereas our review of USACE practices shows that they normally provide 100 percent of those services. Consequently, cost comparisons between USACE and the private sector must be adjusted for this difference.

Most USACE customers are not aware of all of the services that they receive because the services are performed by different organizations within USACE, many of which are never seen by the customer (see Appendix B). In general, customers see only field office staffs and consider their activities to be the construction management for which they are paying. Field office staffs perform about two-thirds of the construction management services, and the other third is performed by USACE Districts, Divisions, and Headquarters (see Figure 1). Additionally, USACE customers are generally unaware that they are not charged for the services they receive from Division offices and the USACE Headquarters since those organizations are funded with Operation and Maintenance Army (OMA) funds. That funding represents a savings to USACE customers of approximately 4 percent of the total construction management costs.

The USACE construction management fee – S&A rate – is divided among the four major categories of construction management services (see Figure 2). A discussion of the division is contained in Appendix B. Some construction management costs, 5.6 percent of the total, are associated with predesign and design and bid-phase services. Those phases are primarily concerned with the engineering aspects of the project, with which construction managers have limited involvement. Construction managers become more heavily involved during the construction phase where 75.7 percent of the construction management dollar is expended for services

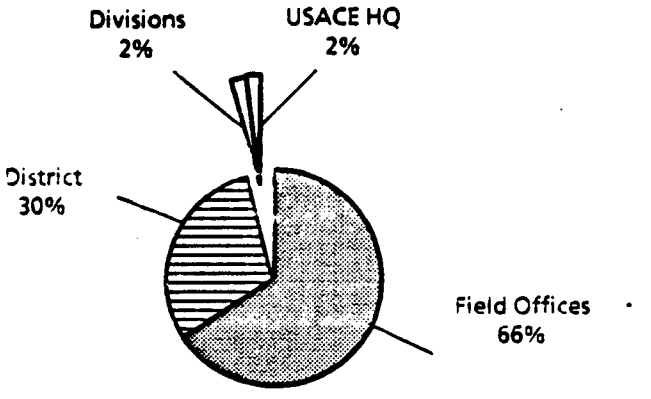

FIG. 1. WHERE USACE CONSTRUCTION MANAGEMENT EFFORT IS EXPENDED

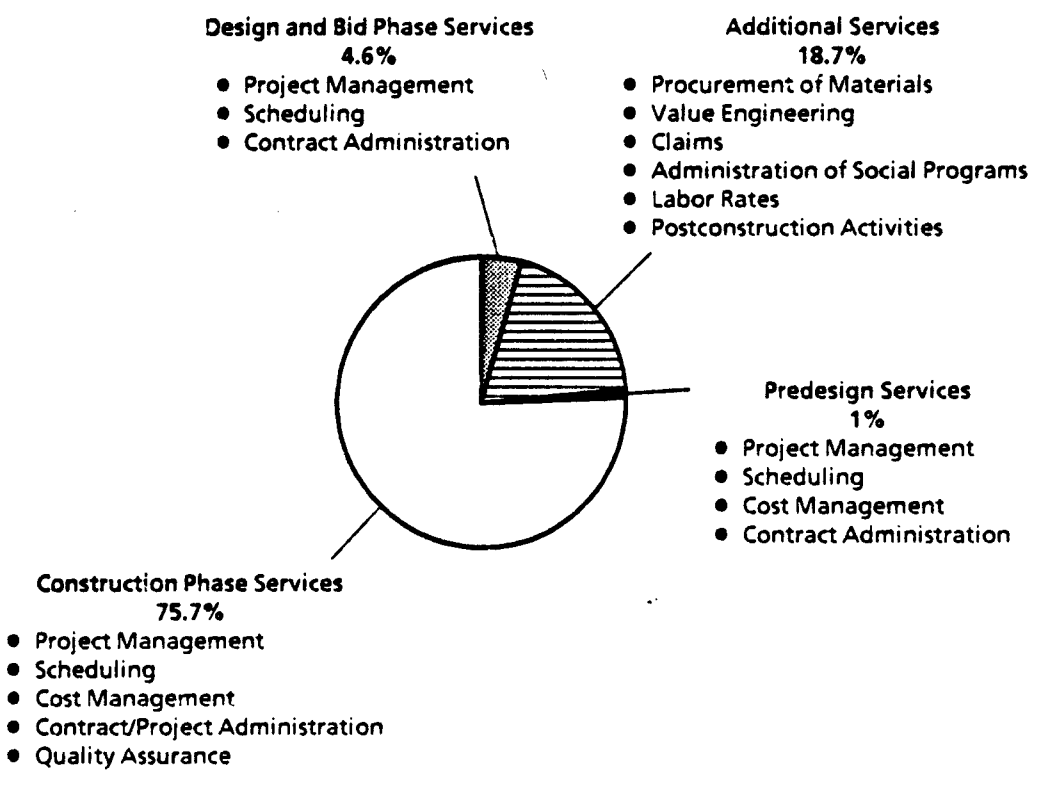

FIG. 2. WHERE THE CONSTRUCTION MANAGEMENT DOLLAR GOES

provided. Most of that effort is associated with the administration and inspection of the project during construction. The remaining 18.7 percent of cost is associated with providing additional services such as procurement of materials, postconstruction activities, etc.

Considerable misunderstanding exists about how the construction management fee or so called "flat rate account" functions. Many customers incorrectly believe that the flat rate should recoup construction management costs on a project-by-project basis. The flat rate accounts are intended to recoup construction management costs from a class of projects such as military construction or operations and maintenance work. The flat rate is used to minimize administrative burden and cost and implicitly recognizes that cross subsidies occur within the class of projects. The classic example is the subsidizing of small projects by large projects. Customers who state that they are being overcharged for the services received on large or simple projects fail to realize that they are also being undercharged on small or complex ones. Over time, with a large number of projects, we believe the flat rate approach is a reasonable alternative to charging actual costs at the project level.

Despite the differences in services available, USACE construction management costs and the private sector fees can be put on a comparable basis. Although USACE construction management costs are not maintained at the project level, they can be estimated with the CERAMMS model as described in Appendix C. Before making a comparison, however, the private sector fees must be adjusted to reflect the provision of full services – the methodology for making this adjustment is described in Appendix D. The results of this comparison are shown in Table 2. USACE costs are generally at or below the average full-service private sector fees for the same type of work, and the USACE weighted average cost is significantly less than that of the private sector.

CONCLUSIONS

Most USACE customers are not aware of all the construction management services they are provided. Customers see the work of the field offices, but do not normally see the 34 percent of the total construction management effort that is expended by other USACE organizations. These unseen services are critical to the management of a construction project. They are not unnecessary "frills" and must be performed by either the customer or the construction manager. Customers must be

TABLE 2

CONSTRUCTION MANAGEMENT COST COMPARISON

Customer	Private sector fee range			USACE costs	
	25th percentile	Median	75th percentile	Estimated average	Fee charged
Family housing – Army	4.6%	5.4%	7.1%	5.0%	5.5%
Family housing – Air Force	4.6	5.4	7.1	5.3	5.5
MILCON – Army	4.9	7.0	9.3	5.4	5.5
MILCON – Air Force	4.9	7.0	9.3	6.1	5.5
MILCON – Army Reserves	4.6	7.4	9.6	5.3	5.5
O&M – Army	4.7	6.5	9.1	8.4	7.5
O&M – Air Force	4.7	6.5	9.1	9.3	7.5
Production base support	3.9%	5.4%	10.8%	5.4%	5.5%
Weighted average	N/A	6.7%	N/A	6.2%	5.9%

Notes: Weighted average calculations are based upon the estimated 1988 placement for each customer.
MILCON = Military construction; O&M = Operations and maintenance.

better educated about the services that they receive for their construction management dollar.

USACE fees are appropriate for the services they provide. Many private sector construction management firms appear to be less expensive than USACE because they do not provide the same level of service. This can be seen from the results of the CMAA survey in Appendix D. A tabulation of these results shows that, on average, private sector firms only provide 80 percent of the services that USACE provides. When private sector costs are adjusted as described in Appendix D to reflect the same level of service, USACE costs are lower.

RECOMMENDATIONS

We believe USACE construction management services and fees are consistent with industry practice. Communicating an accurate picture of USACE construction management should be a top priority for Districts, Divisions, and the Headquarters. Failure to communicate the complete story about construction management services being provided is at the root of much of the discontent exhibited by USACE

customers. Therefore, we recommend that the USACE Chief of Construction develop a briefing package that can be presented to USACE military construction customers and a supporting brochure. The package should consist of slides and an accompanying text that describes USACE S&A services. The brochure should be a "stand-alone" document that can be used by Districts and Divisions during discussions with customers.

We further recommend that the Chief of Construction provide copies of this report to all Districts and Divisions with a military construction mission. By taking these steps, we believe that USACE can significantly improve customer satisfaction.

APPENDIX A

A COMPARISON OF PRIVATE SECTOR AND USACE CONSTRUCTION MANAGEMENT SERVICES

The list of construction management services and responsibilities used in this study was developed by the Construction Management Association of America (CMAA). It is the generally accepted set of definitions used by the industry.

The list is split into two columns. The first column provides the CMAA list of all possible private sector construction management services and their descriptions, while the second column describes the comparable service provided by USACE together with the source of funds. In most cases, the private sector and USACE definition of service are the same, but there are two recurring differences. In the private sector, the owner normally retains contractual authority and the construction manager only makes recommendations. USACE normally has this contractual authority, however, and therefore carries more responsibility than its private sector counterpart. USACE also provides more of the services listed than does the average private-sector construction manager, and for some USACE-provided services, the private sector has no counterparts.

The CMAA list begins on the following page.

CONSTRUCTION MANAGEMENT SERVICES

CMAA	Corps of Engineers
1.0 PREDESIGN PHASE	
1.1 Project Management	
1.1.1 Construction Management Plan	
The construction manager (CM) prepares the Construction Management Plan for the project. He considers the owner's schedule, cost, and design requirements and develops various alternatives for the sequencing and management of the project. He then makes recommendations to the owner. The Construction Management Plan includes a description of the various bid packages recommended for the project and is presented to the owner for acceptance.	Same (funded mainly from P&D).
1.1.2 Design Professional Selection	
The CM assists the owner in the selection of a design professional by developing lists of potential firms, developing criteria for selection, preparing and transmitting the requests for proposal and assisting in reviewing written proposals, conducting interviews, evaluating candidates, and making recommendations.	Same (funded mainly from P&D).
1.1.3 Design Professional Contract Preparation	
The CM assists the owner in review and preparation of the agreement between the Owner and the design professional.	Same (funded from P&D).

CMAA	Corps of Engineers
1.1.4 Design Professional Orientation	
The CM conducts or assists in conducting a design professional orientation session during which the design professional will receive information regarding project, schedule, cost, and administrative requirements.	Same [normally funded from P&D. Some supervision and administration (S&A) for large projects].
1.2 Scheduling	
1.2.1 Master Schedule	
In accordance with the Construction Management Plan, the CM prepares a master schedule for each component of the project. It specifies the proposed start and finish dates for each contract and the dates by which certain construction activities must be complete. The CM submits the master schedule to the owner for acceptance.	Same (funded from P&D).
1.2.2 Design Phase Milestone Schedule	
After the owner's acceptance of the master schedule, the CM prepares the milestone schedule for the design phase. That milestone schedule may be used in requests for proposals and the contract for the design professional, and is a method for judging progress during the design phase.	Same (funded from P&D).
1.3 Cost Management	
1.3.1 Construction Market Survey	
The CM conducts a construction market survey to provide current information on the general availability of local construction services, labor and material cost, and the economic factors related to the project. A report of the survey is provided to the Owner.	Same (funded from P&D).

CMAA	Corps of Engineers
1.3.2 Project and Construction Budget	
Based on the Construction Management Plan and the construction market survey, the CM prepares a project and construction budget and submits it to the owner for acceptance; the CM revises it as the owner directs.	Same (funded from P&D).
1.3.3 Cost Analysis	
The CM analyzes and reports to the owner the cost of various design and construction alternatives. As a part of this cost analysis, the CM considers costs related to efficiency, usable life, maintenance, energy, and operation. Value engineering studies may also be conducted.	Same (funded from P&D).
1.4 Contract/Project Administration	
1.4.1 Establishing the Project MIS	
The CM develops a management information system (MIS) to establish communication among the owner, CM, design professional, contractor, and other parties on the project. In developing the MIS, the CM interviews the owner's key personnel and others to determine the type of information for reporting, the reporting format, and the desired frequency for distribution of the various reports.	Same: Functions performed via AMPRS COEMIS (funded from P&D).
1.4.2 Design Phase Procedures	
As part of the MIS, the CM establishes procedures for reporting communications and administration during the design phase.	Same: Standard Corps of Engineers reports (funded from P&D).

CMAA	Corps of Engineers
2.0 DESIGN AND BID PHASE	
2.1 Project Management	
2.1.1 Revisions to the Construction Management Plan	
During the design phase the CM makes recommendations to the owner regarding revisions to the Construction Management Plan. Revisions approved by the Owner are incorporated into the Construction Management Plan.	Same (funded mainly from P&D).
2.1.2 Project Conference	
At the start of the design phase, the CM conducts a project conference attended by the design professional, the owner, and others. During the project conference, the CM reviews the Construction Management Plan, the master schedule, design phase milestone schedule, the project and construction budget, and the MIS.	Same (funded mainly from P&D).
2.1.3 Design Phase Information	
The CM monitors the design professional's compliance with the Construction Management Plan and the MIS and coordinates and expedites the flow of information among the owner, design professional, and others.	Same (funded from P&D).
2.1.4 Project Meetings	
The CM conducts periodic project meetings attended by the owner, design professional, and others. Such meetings serve as a forum for the exchange of information about the project and the review of design progress. The CM prepares and distributes minutes of these meetings to the owner, design professional, and others.	Same (funded mainly from P&D).

CMAA	Corps of Engineers
2.1.5 Review of Design Documents	
The CM reviews the design documents for clarity, consistency, and completeness. The results of the review are provided in writing and as notations on the documents. The CM is not responsible for providing, nor does the CM control, the project design and the contents of the design documents. By performing the reviews described herein, the CM is not acting in a manner so as to assume responsibility or liability, in whole or in part, for all or any part of the project design and design documents. The CM's actions in reviewing the project design and design documents and in making recommendations as provided herein, are only advisory to the owner.	The Corps is responsible to the owner for the quality of the design (funded from P&D and some S&A).
2.1.6 Design Recommendations	
The CM makes recommendations to the owner and design professional with respect to constructability, construction cost, sequence of construction, construction duration, and separation of the project into contracts for various categories of the work.	Same (funded from P&D and some S&A).
2.1.7 Owner's Design Reviews	
The CM expedites the owner's design reviews by compiling and conveying the owner's comments to the design professional.	Same (funded from P&D).
2.1.8 Approvals by Regulatory Agencies	
The CM coordinates transmittal of documents to regulatory agencies for review, and advises the owner of potential problems in completion of such reviews.	Same (funded from P&D).

CMAA	Corps of Engineers
2.1.9 General Conditions	
The general conditions to the contract documents for the project are CMAA Document No. A-3. Separate general conditions for materials and for equipment procurement are prepared by the CM to meet the specific requirements of the project.	The Corps uses the Government's standard General Conditions (funded from P&D and S&A).
2.1.10 Public Relations	
The CM assists the Owner in public relations activities. He prepares information for and attends public meetings.	Same (funded from P&D and S&A).
2.1.11 Project Funding	
The CM assists the owner in preparing documents concerning the Project and Construction Budget for obtaining or reporting on project funding. The documents are prepared in a form approved by the Owner.	Same: Standard Government forms are used (funded from P&D).
2.1.12 Prequalifying Bidders	
The CM assists the owner in developing lists of possible bidders and in prequalifying bidders. This service includes the following: (1) preparation and distribution of questionnaires; (2) receiving and analyzing completed questionnaires; (3) interviewing possible bidders, bonding agents, and financial institutions; and (4) preparing recommendations for the owner. The CM prepares a bidders' list for each bid package.	Same, but rarely used except for very large or very unusual jobs (funded from P&D and S&A).

CMAA	Corps of Engineers
2.1.13 Notices and Advertisements	
The CM assists the owner in preparing and placing notices and advertisements to solicit bids for the project.	Same (funded from P&D).
2.1.14 Delivery of Bid Documents	
The CM expedites the delivery of bid documents to the bidders. He obtains the documents from the design professional and arranges for printing, binding, wrapping and delivery to the bidders. He also maintains a list of the bidders receiving bid documents.	Same (funded from P&D).
2.1.15 Bidder's Interest Campaign	
The CM conducts a telephonic and correspondence campaign to attempt to increase interest among qualified bidders.	Same where and when appropriate (funded from P&D).
2.1.16 Pre-bid Conference	
In conjunction with the owner and design professional, the CM conducts pre-bid conferences. These conferences are a forum for the owner, CM, and design professional to explain the project requirements to the bidders, including the schedule, time and cost control, access requirements, the owner's administrative requirements, and technical information.	In addition, the Corps performs site visits with potential contractors on large jobs (funded mainly from S&A with some P&D).
2.1.17 Information to Bidders	
The CM develops and coordinates procedures to provide answers to the bidders' questions.	Same (funded from P&D and some S&A).

CMAA	Corps of Engineers
2.1.18 Addenda	
The CM receives from the design professional a copy of all addenda. He reviews them for clarity, consistency and completeness and distributes copies to each bidder. The CM does not assume responsibility or liability for the project design contents or the design documents.	Same (funded from P&D and some S&A).
2.1.19 Bid Opening and Recommendations	
The CM assists the owner in the bid opening, and evaluates the bids for responsiveness and price. He makes recommendations to the owner concerning the acceptance or rejection of bids.	The Corps makes the decision on acceptance or rejection of bids. With negotiated contracting, there is significant Construction Division involvement (funded from P&D and a little S&A).
2.1.20 Postbid Conference	
The CM conducts a postbid conference to review contract award procedures, schedules, project staffing, and other pertinent issues.	The Corps does not perform this service.
2.1.21 Construction Contracts	
The CM assists the owner in the preparation, delivery, and execution of the contract documents and issues the notice to proceed on behalf of the owner.	Same (funded from P&D).
2.1.22 Preconstruction Conference	
The CM conducts, in conjunction with the owner and design professional, a preconstruction conference during which the CM states the project reporting procedures and other rules.	Same (funded from S&A).

CMAA	Corps of Engineers
2.1.23 Permits, Insurance, and Labor Affidavits	
The CM verifies that the contractor has secured the required building permits, bonds, insurance, labor affidavits and waivers. This action does not relieve the contractor of his responsibility to comply with the provisions of the contract documents.	Same (funded from S&A and some P&D).
2.2 Scheduling	
2.2.1 Revisions to Master Schedule	
While performing the services provided in Paragraphs 2.1.1, 2.1.2, and as necessary throughout the design phase, the CM recommends revisions to the master schedule. The owner will issue, as needed, change orders to the appropriate parties to implement the master schedule revisions.	The Corps issues change orders after advising the owner (funded from P&D).
2.2.2 Monitoring the Design Phase Milestone Schedule	
While performing the services provided in Paragraph 2.1.3 and 2.1.4, the CM monitors compliance with the design phase milestone schedule.	Same (funded from P&D).
2.2.3 Pre-Bid Construction Schedules	
Prior to transmitting contract documents to bidders, the CM prepares a pre-bid construction schedule for each part of the project and makes it available to the bidders during the bid and award phase.	Same, but the Corps provides this service only on large, complex projects with phasing (funded by P&D).

CMAA	Corps of Engineers
2.2.4 Contractor's Construction Schedule	
The CM provides a copy of the master schedule to the bidders. As a part of the notice of award, he informs each contractor of the requirements for the preparation of the contractor's construction schedule. Each contractor prepares his own construction schedule, which provides for completing the work in accordance with the milestone dates in the master schedule. The CM reviews the contractor's construction schedule and determines whether it establishes completion dates that comply with the requirements of the master schedule and the contract documents.	Same, but only used for large, complex projects (funded from S&A).
2.3 Contract/Project Administration	
2.3.1 Project and Construction Budget Revision	
The CM makes recommendations to the owner on design changes that may result in revisions to the project and construction budget.	Same (funded from S&A with some P&D).
2.3.2 Cost Control	
The CM prepares an estimate of the construction cost for each submittal of design drawings and specifications from the design professional. The estimate for each submittal is accompanied by a report to the owner and design professional identifying variances from the project and construction budget. The CM coordinates and expedites the activities of the owner and design professional when changes to the design are required to remain within the project and construction budget.	Same. It is used for developing the current working estimate (funded from P&D).

CMAA	Corps of Engineers
2.3.3 Value Analysis Studies	
The CM provides value analysis studies on major construction components. The results of these studies are in report form and are distributed to the owner, design professional, and others.	Same (funded from P&D).
2.3.4 Tradeoff Studies	
The CM provides tradeoff studies for various minor construction components. The results of the tradeoff studies are in report form and are distributed to the owner, design professional, and others.	Same: This could be part of value analysis (funded from P&D).
2.3.5 Management Information Systems (MIS)	
2.3.5.1 Schedule Reports. In conjunction with the services provided by Paragraph 2.1.4, the CM prepares and distributes schedule maintenance reports to compare actual progress with scheduled progress for the design phase and the overall project.	Same: Provided via AMPRS (funded from P&D).
2.3.5.2 Project Cost Reports. The CM prepares and distributes project cost reports which specify estimated costs compared to the project and construction budget.	Same: Provided via AMPRS and COEMIS (funded from P&D).
2.3.5.3 Cash Flow Report. The CM periodically prepares and distributes a cash flow report.	Same: COEMIS 3011A and 3011C reports (funded from P&D).

CMAA	Corps of Engineers
2.3.5.4 Design-Phase Change Order Report. The CM prepares and distributes design phase change order reports, which list all owner-approved change orders as of the date of the report, and state the effects of the change orders on the project and construction budget, and the master schedule.	Same (funded from P&D).
2.3.6 Estimates for Addenda	
The CM prepares an estimate of cost for all addenda and submits the estimates to the owner for approval. After approval by the owner, the addenda are transmitted to bidders.	Same (funded from P&D).
2.3.7 Analyzing Bids	
Upon receipt of the bids, the CM evaluates them, including alternate prices and unit prices.	Same (funded from P&D and S&A).
3.0 CONSTRUCTION PHASE	
3.1 Project Management	
3.1.1 On-Site Management and Construction Phase Communication Procedures	
The CM provides and maintains a management team on the project site to provide contract administration as an agent of the owner, and he establishes and implements coordination and communication procedures among the CM, owner, design professional, contractors, and others.	Same. Includes claims (funded from S&A).

CMAA	Corps of Engineers
3.1.2 Construction Administration Procedures	
The CM establishes and implements procedures for requests for information, shop drawings and material sample submittals, contract schedule adjustments, change orders, payment requests, and the maintenance of logs. The CM maintains daily job reports. As the owner's representative at the construction site, the CM receives requests for information, submittals, contractor schedule, adjustment, change order requests, and payment requests.	The Corps also includes the review of shop drawings (funded from S&A).
3.1.3 Project Site Meetings	
Periodically, the CM conducts meetings at the project site with each contractor, and conducts coordination meetings with all contractors, the owner, and the design professional. The CM records, transcribes, and distributes minutes to all attendees, the owner, design professional, and others.	Same (funded from S&A).
3.1.4 Coordination of Independent Consultants	
Technical inspection and testing provided by the design professional or other parties are coordinated by the CM. The CM is provided a copy of all inspection and testing reports on the day of the inspection or test. The CM is not responsible for providing, nor does the CM control the actual performance of technical inspection and testing. The CM is performing a coordination function and is not assuming responsibility or liability for such inspection and testing.	The Corps takes a more active role. Testing is done by quality assurance, not through a design professional (funded from S&A).

CMAA	Corps of Engineers
3.1.5 Substantial Completion	
In conjunction with the design professional, the CM determines when the project and the contractor's work is substantially complete. Prior to issuing a certificate of substantial completion, the CM, in conjunction with the design professional, prepares a list of incomplete work which does not conform to the contract documents. This list is attached to the certificate of substantial completion.	An outside design professional is not invclved (funded from S&A).
3.1.6 Final Completion	
In conjunction with the design professional, the CM determines when the project and the contractor's work is finally complete, and issues a certificate of final completion.	Done via DD 1354. The Corps also tracks fiscal completion (funded from S&A).
3.1.7 Review of Requests for Changes to the Contract Time and Price	
The CM reviews the contents of a request for a change to the contract time or price submitted by a contractor, assembles information concerning the request, endeavors to determine the cause of the request, and makes recommendations to the owner with respect to acceptance of the request.	The Corps normally makes decisions on construction change orders and advises the owner if costs are within the contingency amounts unless the owner has directed different procedures (funded from S&A).
3.1.8 Operation and Maintenance Materials	
The CM receives from the contractor operation and maintenance manuals, warranties and guarantees for materials and equipment installed in the Project.	Same (funded from S&A).

CMAA	Corps of Engineers
3.2 Scheduling	
3.2.1 Master Schedule	
The CM adjusts and updates the master schedule and distributes copies to the owner and design professional. adjustments to the master schedule are made for the benefit of the project.	Same, but only used for large, complex projects (funded from S&A).
3.2.2 Contractor's Construction Schedule	
The CM reviews the contractor's construction schedule and verifies that it complies with the requirements of the contract documents.	Same (funded from S&A).
3.2.3 Schedule Compliance Review	
The CM reviews the progress of construction of each contractor on a monthly basis, evaluates the percentage complete of each construction activity as indicated in the contractor's construction schedule, and reviews percentages with the contractor. This evaluation serves as data for input to the periodic construction schedule report which is prepared and distributed to the contractor, owner, and design professional. The report indicates the actual progress compared to scheduled progress and serves as the basis for the progress payments to the contractor. The CM advises and makes recommendations to the owner concerning the alternative courses of action that the owner may take in its efforts to achieve contract compliance by the contractor.	The Corps usually takes action without owner involvement. Coordination with the owner is needed only for expediting or accelerating the project (funded from S&A).

CMAA	Corps of Engineers
3.2.4 CM Review of Time Extension Requests	
The CM advises the owner on the effect on the master schedule of time extensions requested by the contractor prior to the issuance of a change order.	Same (funded from S&A).
3.2.5 Recovery Schedules	
The CM may require the contractor to prepare and submit a recovery schedule, as specified in the contract documents.	Same (funded from S&A).
3.3 Cost Management	
3.3.1 Allocation of Cost to the Contractor's Construction Schedule	
The contractor's construction schedule has the total contract price allocated among the contractor's scheduled activities so that each of the contractor's activities is allocated a price. The sum of the prices equals the total contractor price. The CM reviews the total contract price allocations and verifies that such allocations are made in accordance with the requirements of the contract documents. Progress payments are based on the contractor's percentage of completion of the scheduled activities as set out in the construction schedule report.	Same (funded from S&A).

CMAA	Corps of Engineers
3.3.2 Change Order Control	
The CM establishes and implements a change order control system. All proposed change orders are first described in detail in a request for a proposal to the contractor and are accompanied by technical drawings and specifications prepared by the design professional. In response to the request for a proposal, the contractor submits to the CM for evaluation, detailed information concerning the costs and time extensions, if any, to perform the proposed change work order. The CM discusses the proposed change order with the contractor and endeavors to determine the contractor's basis for the cost to perform the work. The CM makes recommendations to the owner prior to execution of change orders being incorporated into the contractor's construction schedule.	Same (funded from S&A).
3.3.3 Project Site Meetings	
Periodically the CM conducts meetings at the project site with each contractor, and conducts coordination meetings with all contractors, and the owner and design professional. The CM records, transcribes, and distributes minutes to all attendees, the owner, design professional, and others.	Same except for distribution (funded from S&A).
3.3.4 Cost Records	
In instances in which a lump sum or unit price is not determined prior to performing work described in a request for a proposal, the CM requests from the contractor, records of the cost of payroll, materials, and equipment, and the amount of payments to subcontractors for performing such work.	Same (funded from S&A).

CMAA	Corps of Engineers
3.4 Contract/Project Administration	
3.4.1 Schedule Maintenance Reports	
The CM prepares and distributes schedule maintenance reports during the construction phase. The report compares the actual construction dates with scheduled construction dates of each separate contract and the master schedule for the project.	Same (funded from S&A).
3.4.2 Project Cost Reports	
The CM prepares and distributes project cost reports during the construction phase; those reports compare actual project and construction costs with the project and construction budget.	Reports are produced by COEMIS and AMPRS. The Corps includes financial completion and return of surplus funds, and there are additional Government financing requirements (funded from S&A).
3.4.3 Project and Construction Budget Revisions	
The CM makes recommendations to the owner on construction changes that may result in revisions to the project and construction budget.	The Corps handles additional Government financing requirements (funded from S&A).
3.4.4 Cash Flow Reports	
The CM prepares and distributes cash flow reports during the construction phase. The reports compare actual cash flow to projected cash flow.	Same: COEMIS, 3011A, and 3011C reports (funded from S&A).

CMAA	Corps of Engineers
3.4.5 Progress Payment Reports (Each Contract)	
The CM prepares and distributes the progress payment reports. These reports state the total construction contract price, payment to date, current payment requested, retainage, and actual amounts owed this period. One portion is a certificate of payment signed by the CM and delivered to the owner for use by the owner in making payments to the contractor.	Same (funded from S&A).
3.4.6 Change Order Reports	
The CM periodically prepares and distributes change order reports during the construction phase. The reports list all owner-approved change orders by number, a brief description of the change order work, the cost established in the change order and percent of completion of the charge order work.	Same (funded from S&A).
3.4.7 Contractor's Safety Program Report	
The CM reports to the owner when the contractor notifies the CM that the contractor has prepared a contractor's safety program as required by the contract documents.	In addition, the Corps enforces accident reporting and investigation procedures, safety inspections, and safety meetings (funded from S&A).

CMAA	Corps of Engineers
3.5 Quality Assurance	
The CM establishes and implements a program to monitor the quality of the construction to assist in guarding against defects and deficiencies in the work of the contractor. The CM rejects work and transmits to the owner and contractor a notice of nonconforming work when it is the opinion of the CM, owner, or design professional that the work does not conform to the requirements of the contract documents. The CM, in conjunction with the design professional, makes recommendations to the owner for corrective action. The CM is not authorized to change or release any requirements of the contract documents. All changes to the agreement between the owner and contactor are by change orders executed by the owner. Communication between the CM and contractor with regard to quality review is not in any way to be construed as binding the CM or owner to release the contractor from the fulfillment of any of the terms of his contract documents. The CM is not responsible for, nor does the CM control, the means and methods of construction for the project. It is understood that the CM's action in providing quality review is a service to the owner and the CM is not assuming responsibility or liability for the construction work for the project.	The Corps of Engineers quality assurance is similar to that defined in Section 3.5 except that the Corps assumes the responsibilities and authorities that Section 3.5 assigns to the owner. The contractual relationship is between the contractor and the Corps, not the owner (funded from S&A).

CMAA	Corps of Engineers
4.0 ADDITIONAL SERVICES	
4.1 Procurement of Materials	
The CM provides procurement services for the owner as designated to include review of specifications, using purchase orders, and overseeing the delivery and storage of materials.	Same (funded from S&A).
4.2 Value Engineering	
The CM arranges for and conducts value engineering analyses on aspects of the project where appropriate.	Same (funded from S&A although costs are carried in most cases through savings).
4.3 Claims Analysis and Processing	
Same as 3.1.7.	The Corps handles the processing, resolution, and negotiation of claims (funded from S&A).
4.4 Administration of Social Programs	
Not applicable.	The Corps is involved in the administration of programs legislated to help small, disadvantaged, and minority businesses (funded from S&A.)
4.5 Labor Rates	
Not applicable.	The Corps administers the Davis-Bacon legislation, which sets minimum wage rates for Government construction (funded from S&A).
4.6 Post Construction Actions	
Not applicable.	The Corps is responsible for the administration of warranties and guaranties (funded from S&A).

APPENDIX B

THE COMPOSITION OF CONSTRUCTION MANAGEMENT COSTS

Construction management in USACE is divided among four organizational levels: field offices, Districts, Divisions, and the Corps Headquarters. Only the field offices and Districts charge their efforts directly to the customer. Division and Corps headquarters support is funded from Operations and Maintenance – Army (OMA) appropriations. When comparing the costs to Corps customers with those of the private sector, we must therefore differentiate between the suppliers of the services and which services are provided. Table B-1 shows the percentage of construction management effort expended for each category of service and Table B-2 shows where construction services are performed. The Division and USACE (Corps Headquarters) columns represent free service to the Corps' customers.

The data in this appendix describe the expenditure of construction management effort and where construction management services are performed. Results were derived by an experienced panel of experts drawn from a variety of organizational levels within USACE. Two techniques were used to derive the results. We identified where construction management services are performed by developing a consensus of the panel on the services provided by each organization (see Table B-2). For the expenditure of construction management effort, the panel used a computer software package called Expert Choice to aid the decision making. Expert Choice is a systematic approach that supports the decision-makers in comparing alternatives when many criteria are involved. In Table B-2, the four organizational levels involved in construction management are shown as well as the effort expended at each level for each of the categories of service. In Table B-1, the alternatives were the categories of service, and the decision was how much construction management effort is expended for each service. Through a series of comparisons, the computer program assigned relative weights to the alternatives while monitoring the consistency of the panel's judgments.

TABLE B-1

EXPENDITURE OF CONSTRUCTION MANAGEMENT EFFORT

Service phase	Percent of construction management costs
1.0 Predesign	1.0%
1.1 Project management	0.7
1.2 Scheduling	0.1
1.3 Cost management	0.1
1.4 Contract/project admin.	0.1
2.0 Design and Bid Phase	4.6
2.1 Project management	3.3
2.2 Scheduling	0.7
2.3 Contract/project admin.	0.7
3.0 Construction Phase	75.6
3.1 Project management	20.3
3.2 Scheduling	4.9
3.3 Cost management	4.1
3.4 Contract/project admin.	7.0
3.5 Quality assurance	39.3
4.0 Additional	18.7
4.1 Procurement of materials	0.5
4.2 Value engineering	0.9
4.3 Claims analysis	7.2
4.4 Admin. of social programs	1.9
4.5 Labor rates	2.0
4.6 Postconstruction activities	6.2%
Total	100.0%

TABLE B-2

WHERE CONSTRUCTION MANAGEMENT SERVICES ARE PERFORMED

Service phase	Field office	Dist.	Div.	USACE
1.0 Predesign	1.0%	95.0%	2.5%	1.5%
1.1 Project management	2.0	93.0	3.0	2.0
1.2 Scheduling	0.0	96.0	3.0	1.0
1.3 Cost management	0.0	97.0	2.0	1.0
1.4 Contract/project admin	0.0	98.0	2.0	0.0
2.0 Design and Bid Phase	4.0	92.0	3.0	1.0
2.1 Project management	10.0	84.0	5.0	1.0
2.2 Scheduling	0.0	98.0	2.0	0.0
2.3 Contract/project admin.	0.0	98.0	2.0	0.0
3.0 Construction Phase	76.0	20.0	2.0	2.0
3.1 Project management	84.0	15.0	1.0	0.0
3.2 Scheduling	92.0	7.0	0 5	0.5
3.3 Cost management	90.0	8.0	1 0	1.0
3.4 Contract/project admin.	48.0	48.0	2.0	2.0
3.5 Quality assurance	84.0	10.0	2.0	4.0
4.0 Additional	48.0	49.0	2.0	1.0
4.1 Procurement of materials	25.0	75.0	0.0	0.0
4.2 Value engineering	35.0	63.0	2.0	0.0
4.3 Claims analysis	58.0	40.0	1.0	1.0
4.4 Admin. of social programs	10.0	87.0	2.0	1.0
4.5 Labor rates	90.0	10.0	0.0	0.0
4.6 Postconstruction activities	90.0%	8.0%	1.0%	1.0%

APPENDIX C

ESTIMATING ACTUAL USACE CONSTRUCTION MANAGEMENT COSTS WITH THE CERAMMS MODEL

The Corps of Engineers Resource and Military Manpower System (CERAMMS) is a computer-based model developed to forecast the manpower required to staff engineering and construction management projects. The model is based upon statistical analysis of more than 10,000 Corps of Engineers' design and construction projects. The U.S. Army Requirements and Documentation Agency (USAMARDA) has reviewed and approved CERAMMS. It has been used by USACE to forecast requirements and allocate manpower to Divisions for the past 2 years.

USACE does not maintain construction management cost records at the project level. Instead, it uses the revolving fund to accumulate earnings and then disburses those earnings to pay the cost of providing construction management services. Earnings are generated by charging customers a fee for each dollar of construction placed. The fee is normally the S&A flat rate. For example: $10 million of Military Construction Army (MCA) placement would generate $550,000 of earnings.

$$\$10\ million\ placement \times 5.5\%\ rate = \$550{,}000\ earnings$$

Construction management costs include salaries, rents, overhead expenses, etc. As a result, USACE cannot identify the construction management costs specifically associated with any project or class of projects. Despite this shortcoming in the accounting system it is possible to estimate what these costs are with a relatively high degree of confidence.

The estimate is made by using actual USACE construction workload for FY88 and FY89 in conjunction with the CERAMMS model. A model output is the number of man-years required to provide construction management services for the placement in a program. The cost of a man-year, including all indirect costs, can be obtained from USACE resource management records. The cost of providing construction management services can be calculated by multiplying the cost per man-year times the number of man-years required. The estimated S&A rate that this would represent can be determined by dividing the cost for construction management services by the placement associated with the requirement.

$$Man-years \times cost\ per\ man-year = Total\ cost$$

$$\frac{Total\ cost}{Placement} = Estimated\ rate$$

This estimated rate is then compared to private sector fees. Our experience with the CERAMMS model has shown that it can forecast manpower requirements with an accuracy of ±5 percent. We believe this methodology can estimate actual construction management costs within the same level of accuracy since manpower costs are approximately 80 percent of the construction management costs.

APPENDIX D

PRIVATE SECTOR CONSTRUCTION MANAGEMENT COSTS AND A METHODOLOGY FOR ADJUSTING THEM TO REFLECT FULL SERVICE COSTS

The construction management industry in the United States is relatively new. In contrast to the engineering industry, it has little data available to describe the fees charged for providing construction management services. Until recently, few agreed on what services constituted construction management. The Construction Management Association of America (CMAA) has recently completed a draft *Standards of Practice Manual*, which describes in detail those services that constitute construction management. In a parallel effort, CMAA has also collected data on the fees charged to provide those services. The collected data are shown at the end of this appendix and the questionnaire is presented at Appendix E.

The results of the questionnaire clearly point out that there is a wide range in the number of services provided by construction management firms. On average, these firms provide only 80 percent of the services that a full-service company would provide. Thus, the fees for any given project must be adjusted to reflect the services provided before making cost comparisons with the Corps of Engineers, a full-service organization. The basis for the adjustment was a quantification of the relative costs of providing construction management services as described in Appendix B. Each private sector project was brought up to a full-service cost by adding in the costs for missing services as a percentage of the reported costs. The distribution of the adjusted costs was then used in the comparison of USACE construction management costs to those in the private sector.

SURVEY RESPONSES

The initial survey was sent out on 10 March 1988 to 162 of the CMAA's membership – those companies that perform CM functions. Table D-1 summarizes the response information.

GENERAL COMPANY DATA

Table D-2 shows the distribution of valid company responses classified by the company's predominant type of work. Although companies were asked to mark only

TABLE D-1

SUMMARY OF VALID SURVEY RESPONSES

	Number	Percentage
Companies mailed surveys	162	N/A
Valid company responses	34	21
Valid project responses	162	17[a]

[a] Assumes each company could potentially provide six valid project responses.

one choice on the survey, many felt strongly enough to give a dual classification. Most of the respondents, 74 percent, classified themselves as pure construction management companies or a combination of CM and general contractor.

TABLE D-2

DISTRIBUTION BY TYPE OF COMPANY

Company type	No. of respondents	Percentage
A General contractor	0	N/A
B Construction Management Co.	18	53
C Architectural and Engineering	3	9
D Other	1	3
A&B General & CM Co.	7	21
A&B&C	1	3
B&C	1	3
No answer	3	9

Note: Percentages may not add to 100% because of rounding.

Table D-3 shows the distribution of the valid responses by total staff size. The companies were asked to give a full-time equivalent of the part time and consultant staff. Most of the responses were from small construction management companies and 78 percent of those companies employed 50 people or fewer.

The distribution by clientele is shown in Table D-4. Companies were classified as having either private sector or Government clientele if they indicated that

TABLE D-3

DISTRIBUTION BY COMPANY SIZE

Company size	No. of respondents	Percentage
A 1 - 5	7	21
B 6 - 10	7	21
C 11 - 15	3	9
D 16 - 25	5	15
E 26 - 50	4	12
F 51 - 100	2	6
G 101 - 150	0	N/A
H 151 - 250	1	3
I 251 - 500	1	3
J over 500	1	3
No answer	3	9

Note: Percentages may not add to 100% because of rounding.

75 percent of their contracts came from those sources. Otherwise, they were said to be mixed. Few of the survey's participants (12 percent) contract most of their work with the Government.

TABLE D-4

DISTRIBUTION BY CLIENTELE

	No. of respondents	Percentage
Government	4	12
Private sector	22	65
Mixed	6	18
No answer	2	6

Note: Percentages may not add to 100% because of rounding.

Table D-5 summarizes company data on fees charged by CM companies, CM companies' customers, and the percentage of Government and private-sector contracts. The results indicate that lump-sum-fixed-fee and cost-plus-fixed-fee are the most popular types of fees that CM companies charge. They also show that most construction management work in the private sector is for the corporate/industrial, housing, commercial development, corporate/administrative/commercial, and educational/ institutional customers.

TABLE D-5

GENERAL COMPANY DATA

	Percentage
1. Types of fees charged by construction management company	
a. Lump Sum – Fixed Fee	45
b. Cost Plus Fixed Fee	29
c. Time spent (with max. or T&M)	12
d. Percentage of construction contract	12
e. Other	2
2. Types of customers construction management companies provide services for	
a. Health care providers	5
b. Corporate/industrial	18
c. Housing/lodging	14
d. Commercial developers	13
e. Corporate/administrative/ commercial	20
f. Educational/institutional	15
g. Private religious/cultural	3
h. State and local government	7
i. Environmental Protection Agency	1
j. Transportation departments	3
k. Department of Defense	1
3. Percentage of government vs. private sector clientele	
a. Government clients	23
b. Private sector clients	77

Note: Percentages may not add to 100% because of rounding.

A more thorough breakdown of revenues by size of company and type of company is included in Table D-6. Overall, the CM companies surveyed average $6.2 million in annual revenues and complete seven projects a year. Combined general contractor and CM companies were the largest revenue generators.

Architect and engineering (A&E) firms had the greatest number of construction management projects, although the projects tend to generate less revenue on a per-project basis. This is probably because A&E firms tend to provide fewer services than the pure CM companies.

TABLE D-6

SUMMARY OF ANNUAL REVENUES FROM CONSTRUCTION MANAGEMENT PROJECTS

	Average annual CM revenues ($)	Average no. projects
Overall	$ 6,207,454	7
Size of Company (1)		
A 1 - 5	2,688,333	6
B 6 - 10	1,640,021	8
C 11 - 15	717,867	4
D 16 - 25	12,703,929	8
E 26 - 50	4,264,667	4
F 51 - 100	6,875,000	26
G Over 100	18,779,666	6
Unknown	$ 12,000,000	2
Type of Company (2)		
A General contractor	N/A	N/A
B Construction Management Co.	$ 4,151,970	5
C A&E firm	1,183,333	12
A&B	12,842,800	6
A&B&C	4,000,000	3
B&C	7,996,000	8
Unknown	$ 12,000,000	2

DIRECT AND INDIRECT COSTS

The summary of direct and indirect costs as a percentage of total CM revenues is presented in Table D-7. The median, 25th percentile, and 75th percentile, are shown for all the valid responses. The data are also analyzed by size and type of company. After screening the original data, we found only 21 of the 34 responses to appear reasonable. Many of the responses clearly demonstrated the participant was not aware of the type of information being sought and such information was not used in the analysis.

The results in Table D-7 are intended to provide a sense of how the industry is allocating direct and indirect CM costs. As could be expected, the way each company allocated its costs varied widely. However, the median responses indicate that most companies are allocating about half of their costs to direct labor, about 25 percent to general and administrative (G&A) expenses and labor, about 15 percent to payroll burden, and about 10 percent to nonlabor indirect expenses. The size and type of company had little effect on the results except that companies larger than 15 people seemed to have a lower percentage of direct labor costs.

PROJECT DATA

In the last part of the survey, the participants were asked to submit information on at least six individual projects that their company had performed CM services for. The survey asked for type of construction project, geographic location of the construction project, the scope of the construction project (new construction or renovation), type of contract (CM as owners agent or CM provides guaranteed max price), the basis for internally estimating the CM contract value, and the value of the CM and construction contracts.

Table D-8 shows the distribution of the 162 valid projects by the geographic location of the construction site. The information indicates that CMAA members perform most of their CM work in the northeast, south, and midwest. Table D-9 shows the states located in the listed regions.

Table D-10 shows the distribution of the 162 valid responses by project type. It indicates the specific types of construction projects for which CM services were provided.

TABLE D-7

SUMMARY OF DIRECT AND INDIRECT CM COSTS

(As a % of CM Revenues)

	Direct labor expenses			Payroll burden			G&A labor expenses			G&A nonlabor expenses			Nonlabor indirect expenses			Number of companies
	25th	Median	75th	25th	Median	75th	25th	Median	75th	25th	Median	75th	25th	Median	75th	
Overall	30	39	50	6	14	19	6	10	13	7	10	17	3	5	10	21
Size of company																
1 – 15	30	40	55	9	15	20	5	10	12	5	12	20	3	5	10	13
Over 15	22	27	41	6	11	15	10	11	14	8	10	12	3	5	10	8
Type of company																
Gen. contractor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N.A	N/A	N/A	0
CM company	33	41	53	6	15	19	5	9	10	7	10	17	3	5	6	11
All other	22	30	50	10	13	16	10	11	14	10	11	18	3	8	12	10

TABLE D-8

DISTRIBUTION OF PROJECTS BY GEOGRAPHIC REGION

Region	No. of projects	Percentage
Northeast	60	37
South	44	27
Midwest	33	20
Southwest	7	4
Mountain	3	2
West	9	6
Other	1	1
Unknown	5	3

Note: Percentages may not add to 100% because of rounding.

TABLE D-9

BREAKDOWN OF GEOGRAPHIC REGIONS BY STATES

Region	States
Northeast	CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT
South	AR, AL, DC, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV
Midwest	IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI
Southwest	AZ, NM, OK, TX
Mountain	CO, ID, MT, NV, WY, UT
West	AK, CA, HI, OR, WA
Other	Canada, Mexico, and Overseas

The 49 types of construction projects were aggregated into fund type categories. Table D-11 shows how the various types of construction tasks were grouped together into the construction categories for this purpose. The projects were grouped by similarities in the type of construction management performed for the various construction types within the general customer headings. The project statistics for each construction category are summarized in Tables D-13 through D-26.

TABLE D-10

DISTRIBUTION OF VALID RESPONSES BY PROJECT TYPE

	No. of respondents	Percentage
Health Care Providers		
(01) Hospitals	3	2%
(03) Clinics/Outpatient Facilities	3	2
(04) Medical Offices	5	3
(05) Extended Care/Nursing Homes	1	1
Corporate/Industrial		
(06) Warehouse/Dist. Centers	10	6
(07) Light Industrial	2	1
(08) Process Plants/Heavy Industrial	10	6
Housing/Lodging		
(09) Hotels (High Rise)	3	2
(10) Motels (Low Rise)	1	1
(11) Apts./Condos. (High Rise)	3	2
(12) Apts./Condos. (Low Rise)	12	7
(13) Single Family Housing	7	4
Commercial Developers		
(14) High Rise Office Bldgs.	5	3
(15) Mid Rise Office Bldgs.	8	5
(16) Low Rise Office Bldgs.	7	4
(17) Shopping Malls (Enclosed)	1	1
(18) Strip Shopping Centers	3	2
Corporate/Administrative/Commercial		
(19) General Offices	14	9
(20) Retail Stores	7	4
(21) Restaurants	1	1%

Notes: Percentages may not add to 100% because of rounding.
Two-digit code refers to CMAA Survey project type.

TABLE D-10

DISTRIBUTION OF VALID RESPONSES BY PROJECT TYPE (Continued)

	No. of respondents	Percentage
Educational/Institutional		
(22) Classrooms	17	10
(23) Science/Research Labs	2	1
(24) Dormitories/Housing	3	2
(25) Sports/Athletic Facilities	4	2
Private Religious/Cultural		
(26) Churches	3	2
(27) Theaters/Auditoriums	4	2
State and Local Government		
(28) Office Buildings	3	2
(29) Museums/Galleries	1	1
(30) Correctional Facilities	4	2
Environmental Protection Agency		
(31) Water Treatment Plants	0	N/A
(32) Wastewater Treatment	0	N/A
(33) Hazardous Waste Facilities	0	N/A
(34) Water/Sewer Lines	0	N/A
Transportation Departments		
(35) Bridges	3	2
(36) Roads	3	2
(37) Tunnels	1	1
(38) Airports	0	N/A
Department of Defense		
(39) Military Housing	0	N/A
(40) Military Offices	1	1
(41) Military Training Facilities	1	1
(42) Military Medical Facilities	0	N/A
(43) Piers/Wharfs	0	N/A
(44) Dredging	0	N/A
(45) Locks and Dams	0	N/A
(46) Reservoirs	0	N/A
(47) Channel Protection	0	N/A
(48) Beach Stabilization	0	N/A

Notes: Percentages may not add to 100% because of rounding
Two-digit code refers to CMAA Survey project type

TABLE D-10

DISTRIBUTION OF VALID RESPONSES BY PROJECT TYPE (Continued)

	No. of respondents	Percentage
Other Federal		
(49) Office Buildings	0	N/A
(50) Postal Facilities	1	1
No answer	5	3

Notes: Percentages may not add to 100% because of rounding.
Two-digit code refers to CMAA Survey project type.

Table D-12 is a summary of the CM fees for all projects by size of company, type of company, and client base. This analysis supports the earlier statement that the CM fee is not affected by the size of the company. However, this table indicates that the pure CM companies are providing CM services at the least cost regardless of the type of construction project. Also, CM companies providing services primarily for the Government are doing so at lower cost than those CM companies providing services primarily for the private sector.

PROJECT STATISTICS SUMMARIES

- *The Construction Management Fee as a Percentage of Construction Contract.* The construction management fee is presented as a percentage of the value of the construction contract. This is done so that a basis for comparing the fees over varying types of construction and conditions can be made. For instance, for each construction type category, the CM fee is given for the following elements:
  - All project
  - CM as owner's agent contracts
  - CM provides guaranteed max price contracts
  - Renovation projects
  - New construction projects.

TABLE D-11

MAPPING OF PRIVATE SECTOR PROJECT TYPES TO CORP OF ENGINEERS FUND TYPES

USACE fund types	Project types
Military Construction	
Family Housing - Army	(11) Apartment/Condos (high rise) (12) Apartments/Condos (low rise) (13) Single Family Housing
Family Housing - A.F.	(11) Apartment/Condos (high rise) (12) Apartments/Condos (low rise) (13) Single Family Housing
Foreign Military Sales	(07) Light Industrial (28) Office Buildings (38) Airports (40) Military Offices (41) Military Training Facilities (42) Military Medical Facilities
Host Nation	(01) Hospitals (07) Light Industrial (24) Dormitories/Housing (25) Sports/Athletic Facilities (28) Office Buildings (31) Water Treatment Plants (36) Roads (39) Military Housing (40) Military Offices (41) Military Training Facilities (42) Military Medical Facilities (49) Federal Office Buildings
Milcon - Army	(01) Hospitals (03) Clinics/Outpatient Facilities (04) Medical Office (06) Warehouse/Distribution Centers (07) Light Industrial (10) Motels (Low Rise) (16) Low Rise Office Buildings (19) General Offices (24) Dormitory/Housing (25) Sports/Athletic Fields (26) Churches (28) Office Buildings (31) Water Treatment Plants (32) Wastewater Treatment (34) Water/Sewer Lines

Note: The two digit number in parenthesis refers to the CMAA survey project category code.

TABLE D-11

MAPPING OF PRIVATE SECTOR PROJECT TYPES TO CORP OF ENGINEERS FUND TYPES (Continued)

USACE fund types	Project types
Milcon - Army (Continued)	(39) Military Housing (40) Military Offices (41) Military Training Facilities (42) Military Medical Facilities
Milcon - A.F.	(01) Hospitals (03) Clinics/Outpatient Facilities (04) Medical Office (06) Warehouse/Distribution Centers (07) Light Industrial (10) Motels (Low Rise) (16) Low Rise Office Buildings (19) General Offices (24) Dormitory/Housing (25) Sports/Athletic Fields (26) Churches (28) Office Buildings (31) Water Treatment Plants (32) Wastewater Treatment (34) Water/Sewer Lines (38) Airports (39) Military Housing (42) Military Training Facilities (42) Military Medical Facilities
Milcon - Army Res	(16) Low Rise Office Buildings (22) Classrooms (49) Federal Office Buildings
Milcon - Other	(04) Medical Office (06) Warehouse/Distribution Centers (07) Light Industrial (08) Process Plants/Heavy Industrial (11) Apartments/Condos (High Rise) (12) Apartments/Condos (Low Rise) (13) Single Family Housing (14) High Rise Office Buildings (15) Mid Rise Office Buildings (20) Retail Stores (22) Classrooms (23) Science Research Labs (24) Dormitory/Housing

Note: The two digit number in parenthesis refers to the CMAA survey project category code

TABLE D-11

MAPPING OF PRIVATE SECTOR PROJECT TYPES TO CORP OF ENGINEERS FUND TYPES (Continued)

USACE fund types	Project types
Milcon - Other (Continued)	(25) Sports/Athletic Fields (26) Churches (27) Theaters/Auditoriums (28) Office Buildings (29) Museums/Galleries (30) Correctional Facilities (31) Water Treatment Plants (32) Wastewater Treatment (33) Hazardous Waste Facilities (34) Water/Sewer Lines (35) Bridges (36) Roads (37) Tunnels (38) Airports (39) Military Housing (40) Military Offices (41) Military Training Facilities (42) Military Medical Facilities (49) Federal Office Buildings (50) Postal Facilities
Operations & Maint-Army	All renovation projects for the following: (01) Hospitals (03) Clinics/Outpatient Facilities (04) Medical Office (06) Warehouse/Distribution Centers (07) Light Industrial (08) Process Plants/Heavy Industrial (10) Motels (Low Rise) (16) Low Rise Office Buildings (19) General Offices (24) Dormitory/Housing (25) Sports/Athletic Fields (26) Churches (28) Office Buildings (31) Water Treatment Plants (32) Wastewater Treatment (34) Water/Sewer Lines (36) Roads (39) Military Housing (40) Military Offices (41) Military Training Facilities (42) Military Medical Facilities (49) Federal Office Buildings

Note: The two digit number in parenthesis refers to the CMAA survey project category code.

TABLE D-11

MAPPING OF PRIVATE SECTOR PROJECT TYPES TO CORP OF ENGINEERS FUND TYPES (Continued)

USACE fund types	Project types
Operations & Maint-A.F.	All renovation projects for the following: (01) Hospitals (03) Clinics/Outpatient Facilities (04) Medical Office (06) Warehouse/Distribution Centers (07) Light Industrial (08) Process Plants/Heavy Industrial (10) Motels (Low Rise) (16) Low Rise Office Buildings (19) General Offices (24) Dormitory/Housing (25) Sports/Athletic Fields (26) Churches (28) Office Buildings (31) Water Treatment Plants (32) Wastewater Treatment (33) Hazardous Waste Facilities (34) Water/Sewer Lines (36) Roads (38) Airports (39) Military Housing (40) Military Offices (41) Military Training Facilities (42) Military Medical Facilities (49) Federal Office Buildings
Production Base Support	(06) Warehouse/Distribution Centers (08) Process Plants/Heavy Indust. (33) Hazardous Waste Facilities (34) Water/Sewer Lines (36) Roads (49) Federal Office Buildings
Defense Env. Restor. Program	(31) Water Treatment Plant (32) Wastewater Treatment (33) Hazardous Waste Facility (34) Water/Sewer Lines
Other	(04) Medical Offices (14) High Rise Office Buildings (20) Retail Stores (26) Churches (50) Postal Facilities

Note: The two digit number in parenthesis refers to the CMAA survey project category code

TABLE D-12

SUMMARY OF CONSTRUCTION MANAGEMENT FEE

(As % of construction contract)

	Construction management fee			No. of projects	No. of companies
	25th	Median	75th		
Overall	3.7	5.0	7.2	159	34
Size of company					
1 – 5	3.1	5.0	8.5	33	7
6 – 10	4.6	6.0	9.0	33	7
11 – 15	2.9	5.3	7.5	8	3
16 – 25	4.0	5.5	7.0	29	5
26 – 50	3.4	4.5	5.2	20	4
51 – 100	2.7	4.8	7.1	12	2
Over 100	2.9	4.9	7.0	23	3
No answer				3	3
Type of company					
A. General contractor	N/A	N/A	N/A	0	0
B. Construction Management Firm	3.3	5.0	6.6	86	18
C. A&E Firm	4.3	6.0	9.6	18	3
D. Other	N/A	3.4	N/A	6	1
A&B	3.8	5.0	6.9	37	7
A&B&C	N/A	8.1	N/A	6	1
B&C	N/A	12.7	N/A	6	1
Unknown				3	3
Client Base					
Government	1.9	4.3	6.9	24	4
Private sector	4.2	5.7	8.0	105	22
Mixed	3.0	4.0	6.0	31	6
No answer				2	2

For each of these conditions the 25th percentile, median, 75th percentile, and the number of individual projects in analysis is given. The number of different companies providing the project information is also given so that the reader can see whether the information provided is unique to a single company or whether the data are the result of several different companies projects. The CM fee ranges indicate what the competition is charging and can be used as the starting point to determine an appropriate CM fee for the various types of construction and conditions. Where an N/A is given, too few data points were available to meaningfully consider the 25th and 75th percentile statistics.

The analysis in this section assumes that there is no significant difference in fees charged by various size and type of company. While the geographic location of the project may affect the CM fee, that factor was not analyzed in this study.

Following each table, the average value of the construction and CM contracts that comprised the CM fee analysis is shown.

- *Basis for Estimating CM Contract Value.* This section of each table shows what methods are used by the participants of the survey in determining what fee will be charged. Percent of construction contract value, direct and indirect cost calculation, or other may be selected. This information merely provides a means to compare the competition's methods.

- *Summary of CM Services.* Each table also shows a summary of the CM services provided for the projects included in the construction category. The types of services are defined in the CMAA "Standards of Practices" manual.

TABLE D-13

FAMILY HOUSING - ARMY

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	4.5	5.0	5.3	12	10
CM as owner's agent	3.8	5.0	5.3	10	8
CM provides guaranteed max price	N/A	7.9	N/A	2	2
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	4.5	5.0	5.3	12	10

Average Value of Construction Contract	$ 6,091,667
Average Value of CM Contract	$ 305,167

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	50%
Direct and Indirect Cost Calculation	33%
Other	17%

Summary of Construction Management Services

Predesign Phase Services

Project Management	67%
Scheduling	67%
Cost Management	67%
Contract/Project Administration	67%

Design and Bid Phase Services

Project Management	83%
Scheduling	83%
Contract/Project Administration	83%

Construction Phase Services

Project Management	92%
Scheduling	92%
Cost Management	92%
Contract/Project Administration	92%
Quality Assurance	100%

Additional Services

Procurement of Materials	58%
Value Engineering	75%
Cost Estimating	92%
Constructability Review	92%
Materials Testing	50%
Claims Analysis	17%
Other	17%

TABLE D-14

FAMILY HOUSING - AIR FORCE

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	4.5	5.0	5.3	12	10
CM as owners agent	3.8	5.0	5.3	10	8
CM provides guaranteed max price	N/A	7.9	N/A	2	2
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	4.5	5.0	5.3	12	10

Average Value of Construction Contract	$ 6,091,667
Average Value of CM Contract	$ 305,167

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	50%
Direct and Indirect Cost Calculation	33%
Other	17%

Summary of Construction Management Services

Predesign Phase Services

Project Management	67%
Scheduling	67%
Cost Management	67%
Contract/Project Administration	67%

Design and Bid Phase Services

Project Management	83%
Scheduling	83%
Contract/Project Administration	83%

Construction Phase Services

Project Management	92%
Scheduling	92%
Cost Management	92%
Contract/Project Administration	92%
Quality Assurance	100%

Additional Services

Procurement of Materials	58%
Value Engineering	75%
Cost Estimating	92%
Constructability Review	92%
Materials Testing	50%
Claims Analysis	17%
Other	17%

TABLE D-15

FOREIGN MILITARY SALES

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	3.7	5.0	6.0	5	3
CM as owner's agent	N/A	4.3	N/A	4	3
CM provides guaranteed max price	N/A	12.0	N/A	1	1
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	3.7	5.0	6.0	5	3

Average Value of Construction Contract	$ 193,300,000
Average Value of CM Contract	$ 1,270,000

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	20%
Direct and Indirect Cost Calculation	80%
Other	0%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	80%
Scheduling	40%
Cost Management	40%
Contract/Project Administration	40%
Design and Bid Phase Services	
Project Management	80%
Scheduling	60%
Contract/Project Administration	60%
Construction Phase Services	
Project Management	100%
Scheduling	80%
Cost Management	80%
Contract/Project Administration	80%
Quality Assurance	60%
Additional Services	
Procurement of Materials	20%
Value Engineering	40%
Cost Estimating	40%
Constructability Review	20%
Materials Testing	20%
Claims Analysis	20%

TABLE D-16

HOST NATION

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	3.7	6.0	7.5	13	9
CM as owner's agent	3.1	5.0	6.6	11	8
CM provides guaranteed max price	N/A	9.8	N/A	2	2
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	3.7	6.0	7.5	13	9

Average Value of Construction Contract	$ 117,010,000
Average Value of CM Contract	$ 5,353,462

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	15%
Direct and Indirect Cost Calculation	77%
Other	8%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	62%
Scheduling	54%
Cost Management	46%
Contract/Project Administration	54%
Design and Bid Phase Services	
Project Management	85%
Scheduling	77%
Contract/Project Administration	74%
Construction Phase Services	
Project Management	85%
Scheduling	92%
Cost Management	77%
Contract/Project Administration	92%
Quality Assurance	77%
Additional Services	
Procurement of Materials	15%
Value Engineering	46%
Cost Estimating	69%
Constructability Review	46%
Materials Testing	23%
Claims Analysis	38%

TABLE D-17

MILCON - ARMY

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	3.7	5.0	6.7	38	20
CM as owner's agent	3.5	5.0	6.5	31	15
CM provides guaranteed max price	3.8	7.5	15.0	7	7
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	3.7	5.0	6.7	38	20

Average Value of Construction Contract	$ 50,131,211
Average Value of CM Contract	$ 1,340,066

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	34%
Direct and Indirect Cost Calculation	47%
Other	18%

Summary of Construction Management Services

Predesign Phase Services

Project Management	74%
Scheduling	66%
Cost Management	71%
Contract/Project Administration	66%

Design and Bid Phase Services

Project Management	87%
Scheduling	95%
Contract/Project Administration	92%

Construction Phase Services

Project Management	97%
Scheduling	89%
Cost Management	87%
Contract/Project Administration	89%
Quality Assurance	79%

Additional Services

Procurement of Materials	45%
Value Engineering	63%
Cost Estimating	82%
Constructability Review	66%
Materials Testing	32%
Claims Analysis	21%
Other	5%

TABLE D-18

MILCON – AIR FORCE

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	3.7	5.0	5.7	38	20
CM as owner's agent	3.5	5.0	6.5	31	15
CM provides guaranteed max price	3.5	7.5	15.0	7	7
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	3.7	5.0	5.7	38	20

Average Value of Construction Contract	$ 50,131,211
Average Value of CM Contract	$ 1,340,066

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	34%
Direct and Indirect Cost Calculation	47%
Other	18%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	74%
Scheduling	66%
Cost Management	71%
Contract/Project Administration	66%
Design and Bid Phase Services	
Project Management	87%
Scheduling	95%
Contract/Project Administration	92%
Construction Phase Services	
Project Management	97%
Scheduling	89%
Cost Management	87%
Contract/Project Administration	89%
Quality Assurance	79%
Additional Services	
Procurement of Materials	45%
Value Engineering	63%
Cost Estimating	82%
Constructability Review	66%
Materials Testing	32%
Claims Analysis	21%
Other	5%

TABLE D-19

MILCON - ARMY RESERVES

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CM fee			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	3.9	6.3	7.1	15	9
CM as owner's agent	3.9	6.0	6.9	13	8
CM provides guaranteed max price	N/A	7.4	N/A	2	2
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	3.9	6.3	7.1	15	9

Average Value of Construction Contract	$ 6,933,333
Average Value of CM Contract	$ 212,919

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	53%
Direct and Indirect Cost Calculation	27%
Other	20%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	80%
Scheduling	87%
Cost Management	87%
Contract/Project Administration	80%
Design and Bid Phase Services	
Project Management	87%
Scheduling	93%
Contract/Project Administration	93%
Construction Phase Services	
Project Management	93%
Scheduling	93%
Cost Management	93%
Contract/Project Administration	93%
Quality Assurance	87%
Additional Services	
Procurement of Materials	53%
Value Engineering	60%
Cost Estimating	67%
Constructability Review	93%
Materials Testing	40%
Claims Analysis	13%

TABLE D-20

MILCON - OTHER

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	3.7	5.0	7.0	77	26
CM as owner's agent	3.1	5.0	6.5	63	23
CM provides guaranteed max price	4.0	7.3	11.1	14	8
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	3.7	5.0	7.0	77	26

Average Value of Construction Contract	$ 40,500,922
Average Value of CM Contract	$ 1,698,236

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	40%
Direct and Indirect Cost Calculation	40%
Other	19%

Summary of Construction Management Services

Predesign Phase Services

Project Management	71%
Scheduling	70%
Cost Management	70%
Contract/Project Administration	70%

Design and Bid Phase Services

Project Management	82%
Scheduling	82%
Contract/Project Administration	84%

Construction Phase Services

Project Management	92%
Scheduling	95%
Cost Management	86%
Contract/Project Administration	96%
Quality Assurance	84%

Additional Services

Procurement of Materials	51%
Value Engineering	62%
Cost Estimating	81%
Constructability Review	74%
Materials Testing	38%
Claims Analysis	25%
Other	5%

TABLE D-21

OPERATIONS & MAINTENANCE - ARMY

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	4.2	5.1	7.1	28	17
CM as owner's agent	4.0	5.0	7.0	25	16
CM provides guaranteed max price	N/A	7.2	N/A	3	2
Renovation	4.2	5.1	7.1	28	17
New construction	N/A	N/A	N/A	N/A	N/A

Average Value of Construction Contract	$ 26,414,464
Average Value of CM Contract	$ 1,252,620

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	29%
Direct and Indirect Cost Calculation	46%
Other	25%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	68%
Scheduling	57%
Cost Management	64%
Contract/Project Administration	61%
Design and Bid Phase Services	
Project Management	82%
Scheduling	89%
Contract/Project Administration	86%
Construction Phase Services	
Project Management	93%
Scheduling	93%
Cost Management	82%
Contract/Project Administration	89%
Quality Assurance	79%
Additional Services	
Procurement of Materials	46%
Value Engineering	61%
Cost Estimating	82%
Constructability Review	68%
Materials Testing	25%
Claims Analysis	39%

TABLE D-22

OPERATIONS & MAINTENANCE - AIR FORCE

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	4.2	5.1	7.1	28	17
CM as owner's agent	4.0	5.0	7.0	25	16
CM provides guaranteed max price	N/A	7.2	N/A	3	2
Renovation	4.2	5.1	7.1	28	17
New construction	N/A	N/A	N/A	N/A	N/A

Average Value of Construction Contract	$ 26,414,464
Average Value of CM Contract	$ 1,252,620

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	29%
Direct and Indirect Cost Calculation	46%
Other	25%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	68%
Scheduling	57%
Cost Management	64%
Contract/Project Administration	61%
Design and Bid Phase Services	
Project Management	82%
Scheduling	89%
Contract/Project Administration	86%
Construction Phase Services	
Project Management	93%
Scheduling	93%
Cost Management	82%
Contract/Project Administration	89%
Quality Assurance	79%
Additional Services	
Procurement of Materials	46%
Value Engineering	61%
Cost Estimating	82%
Constructability Review	68%
Materials Testing	25%
Claims Analysis	39%

TABLE D-23

PRODUCTION BASE SUPPORT

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	2.9	4.3	6.5	15	9
CM as owner's agent	2.9	4.5	6.5	14	8
CM provides guaranteed max price	N/A	3.8	N/A	1	1
Renovation	N/A	N/A	N/A	N/A	N/A
New construction	2.9	4.3	6.5	15	9

Average Value of Construction Contract	$ 96,051,667
Average Value of CM Contract	$ 5,735,000

Basis for Estimating CM Contract Value

Percent of Construction Contract Value	27%
Direct and Indirect Cost Calculation	60%
Other	13%

Summary of Construction Management Services

Predesign Phase Services	
Project Management	40%
Scheduling	33%
Cost Management	40%
Contract/Project Administration	33%
Design and Bid Phase Services	
Project Management	60%
Scheduling	73%
Contract/Project Administration	73%
Construction Phase Services	
Project Management	87%
Scheduling	100%
Cost Management	73%
Contract/Project Administration	100%
Quality Assurance	80%
Additional Services	
Procurement of Materials	40%
Value Engineering	33%
Cost Estimating	60%
Constructability Review	67%
Materials Testing	40%
Claims Analysis	40%
Other	7%

TABLE D-24

DEFENSE ENVIRONMENT RESTORATION PROGRAM

CONSTRUCTION MANAGEMENT FEE AS PERCENTAGE OF CONSTRUCTION COST

	CMF			No. of projects in analysis	No. of companies
	25%	Median	75%		
Overall fee	N/A	N/A	N/A	0	0
CM as owner's agent					
CM provides guaranteed max price					
Renovation					
New construction					

Average Value of Construction Contract $
Average Value of CM Contract $

Basis for Estimating CM Contract Value

Percent of Construction Contract Value %
Direct and Indirect Cost Calculation %
Other (Cost-plus Fee) %
Other (Project Duration Calculation) %

Summary of Construction Management Services

Predesign Phase Services

Project Management %
Scheduling %
Cost Management %
Contract/Project Administration %

Design and Bid Phase Services

Project Management %
Scheduling %
Contract/Project Administration %

Construction Phase Services

Project Management %
Scheduling %
Cost Management %
Contract/Project Administration %
Quality Assurance %

Additional Services

Procurement of Materials %
Value Engineering %
Cost Estimating %
Constructability Review %
Materials Testing %
Claims Analysis %

APPENDIX E

SAMPLE QUESTIONNAIRE FOR THE CONSTRUCTION MANAGEMENT COSTS SURVEY

SPECIAL INSTRUCTIONS FOR SURVEY

6. Indicate the types of fees, as a percentage, charged by your company for the following types of fees listed. Must add to 100%.

   A. Lump Sum – set amount (fixed fee) for the CM work
   B. Cost-plus fixed fee – owner pays for all costs and overhead as incurred on the project plus a fixed fee (profit)
   C. Time Spent – fee is based on an hourly predetermined rate. Owner is billed for (hours) x (rate).
   D. Percentage of Construction Contract – fee is determined as a percentage of the actual construction contract amount. Fee = % × Construction ($)

7. Here we would like to determine your company's areas of expertise. Indicate, as a percentage of all CM projects, the areas of construction that your company provides CM services for. Indicate 0% where appropriate. Must add to 100%.

8 – 12 All information for items 10 – 14 pertain to your most recent financial year. Please indicate these numbers as a percentage of total construction management revenues where indicated.

Direct Labor	– All unburdened labor charged to projects including the portions charged by principals and nontechnical employees.
Payroll Burden	– All expenses paid by the company for mandatory payroll taxes, vacation leave, sick leave, holiday leave, personnel leave, group insurance, pension plans, etc., for both direct and indirect labor.
G&A Labor	– All non-project labor expenses for the technical staff, principals, and administrative staff.
G&A Expenses	– All indirect expenses for rents, utilities, maintenance, depreciation, interest, basic service telephone, insurance, loan interest, uncollectable debt, training and education expenses, legal and account expenses, general supplies (nonproject), and administrative labor.
Non-labor Direct	– All project-related expenses including travel, printing, telephone, outside consulting fees, and project related supplies.

SPECIAL INSTRUCTIONS FOR SURVEY

13. **Indicate the type of construction project that you are providing information for from the table below. Please limit your response to those projects that represent a significant portion of your company's annual revenues. Construction projects were grouped by most common owner.**

Health Care Providers
- 01 Hospitals
- 03 Clinics/Outpatient Facilities
- 04 Medical Office
- 05 Extended Care/Nursing Homes

Corporate/Industrial
- 06 Warehouse/Dist. Centers
- 07 Light Industrial
- 08 Process Plants/Heavy Industrial

Housing/Lodging
- 09 Hotels (High Rise)
- 10 Motels (Low Rise)
- 11 Apts./Condos (High Rise)
- 12 Apts./Condos (Low Rise)
- 13 Single Family Housing

Commercial Developers
- 14 High Rise Office Building
- 15 Mid Rise Office Building
- 16 Low Rise Office Building
- 17 Shopping Malls (Enclosed)
- 18 Strip Shopping Centers

Corporate/Administrative/Commercial
- 19 General Offices
- 20 Retail Stores
- 21 Restaurants

Educational/Institutional
- 22 Classrooms
- 23 Science/Research Labs
- 24 Dormitories/Housing
- 25 Sports/Athletic Facilities

Private Religious/Cultural
- 26 Churches
- 27 Theaters/Auditoriums

State and Local Govt.
- 28 Office Buildings
- 29 Museums/Galleries
- 30 Correctional Facilities

Environmental Protection Agency
- 31 Water Treatment Plants
- 32 Wastewater Treatment
- 33 Hazardous Waste Facilities
- 34 Water/Sewer Lines

Transportation Departments
- 35 Bridges
- 36 Roads
- 37 Tunnels
- 38 Airports

Department of Defense
- 39 Military Housing
- 40 Military Offices
- 41 Military Training Facilities
- 42 Military Medical Facilities
- 43 Piers/Wharfs
- 44 Dredging
- 45 Locks and Dams
- 46 Reservoirs
- 47 Channel Protection
- 48 Beach Stabilization

Other Federal
- 49 Office Buildings
- 50 Postal Facilities

CONSTRUCTION MANAGEMENT ASSOCIATION OF AMERICA
SURVEY OF CONSTRUCTION MANAGEMENT COSTS

1. Size of company (total staff + full-time equivalent of part-time staff)
   - A. 1–5
   - B. 6–10
   - C. 11–15
   - D. 16–25
   - E. 26–50
   - F. 51–100
   - G. 101–150
   - H. 151–250
   - I. 251–500
   - J. Over 500

2. Type of company
   - A. General contractor
   - B. Construction management company
   - C. Architectural and engineering
   - D. Other _____

3. Total annual revenues from construction management projects including subcontract costs. (For most recent fiscal year.) $_____

4. Average number of CM projects completed by your company per year for last 3 years _____

5. Client base (must add to 100 percent)
   - A. Government clients _____%
   - B. Private-sector clients _____%

6. Indicate, as a percentage of all CM projects, the types of fees your company charges the customer (must add to 100% – see "special instructions")
   - A. Lump sum – fixed fee _____%
   - B. Cost plus fixed fee _____%
   - C. Time spent (with max. or T&M) _____%
   - D. Percentage of construction contract _____%
   - E. Other _____ _____%

7. Indicate as a percentage of all CM projects the types of customers your company provides services for (must add to 100% – see "special instructions")
   - A. Health Care Providers _____%
   - B. Corporate/Industrial _____%
   - C. Housing/Lodging _____%
   - D. Commercial Developers _____%
   - E. Corporate/Administrative/Commercial _____%
   - F. Educational/Institutional _____%
   - G. Private Religious/Cultural _____%
   - H. State and Local Government _____%
   - I. Environmental Protection Agency _____%
   - J. Transportation Departments _____%
   - K. Department of Defense _____%

Note: See "special instructions" for definitions of expenses and costs.

8. CM direct labor costs (as a percentage of total CM revenues) _____%
9. Payroll burden (as a percentage of total CM revenues) _____%
10. CM G&A labor (as a percentage of total CM revenues) _____%
11. CM G&A expenses (as a percentage of total CM revenues) _____%
12. CM non-labor direct expenses (as a percentage of total CM revenues) _____%

CONSTRUCTION MANAGMENT PROJECT DATA

NOTE: Provide data for individual projects that your company is currently involved in or has completed within the last 3 years. Complete survey for at least 6 projects. If you would like to provide information for more than 6 projects, please make photo copies of this page and include the results in the survey package. Indicate "yes" answers by marking the appropriate space with an "x".

	Example	Project #1	Project #2	Project #3	Project #4	Project #5	Project #6
13. Type of construction project (select code from list on special instruction page).	30						
14. City and state where construction project occurred	Beth., Md.						
15. Value of construction contract	$100,000						
16. Scope of construction project (mark only one)							
A. Renovation	x						
B. New construction	x						
17. Type of Contract (mark only one)							
A. CM as agent	x						
B. CM provides guaranteed maximum price							
18. CM services provided for the customer (mark as many services as would apply to CM project)							
I. Predesign phase services							
A. Project Management	x						
B. Scheduling	x						
C. Cost Management	x						
D. Contract/Project Administration	x						
II. Design and Bid Phase Service							
A. Project Management	x						
B. Scheduling	x						
C. Contract/Project Administration	x						
III. Construction Phase Services							
A. Project Management	x						
B. Scheduling	x						
C. Cost Management	x						
D. Contract/Project Administration							
E. Quality Assurance							
IV. Additional Services							
A. Procurement of materials	x						
B. Value Engineering							
C. Cost estimating	x						
D. Constructability review	x						
E. Materials Testing	x						
F. Claims Analysis							
G. Other _____							
19. Basis for estimating CM contract value (mark only one)							
A. Percent of construction contract value	x						
B. Direct and indirect cost calculation							
C. Other _____							
20. Value of CM contract ($)	$4,500						
21. Number of CM projects performed by your company that is representative of the above data. (last 3 years only)	4						

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18. SUBJECT TERMS *(Continue on reverse if necessary and identify by block number)*
Military construction, construction management costs, construction management services, U.S. Army Corps of Engineers (USACE)

19. ABSTRACT *(Continue on reverse if necessary and identify by block number)*

The United States Army Corps of Engineers (USACE) manages more than $3 billion of Federal Government construction each year. Its Federal customers include the Office of the Secretary of Defense (OSD), the Military Services, and Federal agencies. The construction management services that USACE provides are paid for through fees assessed against the placement value of the construction.

Some USACE customers have voiced concerns that they are charged more for construction management services than they should be. We found such concerns to be unwarranted. Most USACE customers are unaware of the services that they receive and they do not realize what private sector construction management firms charge for equivalent services.

We find that USACE is a full-service construction management organization and that the fees they charge are appropriate for the services rendered when compared with private sector fees.

We recommend that the Director of Engineering and Construction promulgate the results of our analysis to USACE customers to demonstrate the validity of the Corps' rates and to show where the construction management dollars are spent. A brochure should be prepared to accomplish this purpose.

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